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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/662,406
Filing Date: September 16, 2003
Appellant(s): PARK ET AL.

Daniel Y. J. Kim
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 25 June 2007 appealing from the Office action mailed 23 January 2007.

(1) Real Party in Interest

The above-identified application is assigned, in its entirety, to LG Electronics Inc.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

WITHDRAWN REJECTIONS

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner.

Claims 5 and 14 under 35 U.S.C. § 112, second paragraph.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,222,512	Tajima et al.	4-2001
2003/0011626	Tanabe et al.	1-2003

AAPA, Figure 1 and page 1, line1 to page 4, line 30 of the specification

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 5-6, 14-15, 21-22 and 28-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Tajima et al. (US 6,222,512).

Regarding claim 5, Tajima et al. disclose a driving apparatus for a plasma display panel in which one frame period is time-divided into a plurality of sub-fields each given by a certain weighting value (Figure 1 shows a driving apparatus for a plasma display panel and column 15, lines 36-51 explain that the frame period is divided into a plurality of sub-fields.), said driving apparatus comprising:

a gray level detector for detecting a gray level distribution of a data (Figure 3, gray-scale level adjustment means 75 is explained in column 26 lines 10-45 to have an intensity data arrangement switching means 101 that disperses and arranges the sub-frames.) and

an adjuster for adjusting at least one of the number of sustaining pulses or a sub-field arrangement in accordance with a gray level distribution of said data (Figure 1, the gray-scale level adjustment means 75 is stated in column 16, lines 1-14 to establish which sub-frames are to be combined and how these are to be arranged in sequence. See also column 26, lines 18-52 and column 27, lines 3-19).

Regarding claim 6, Tajima et al. disclose the driving apparatus as claimed in claim 5, wherein said adjuster adjusts both the number of sustaining pulses and- a sub-field arrangement accordance with the gray level distribution of said data (The examiner understands that if the number of subfields and the arrangement is changed, that by changing the subfields used the number of sustaining pulses is changed, please refer to column 27, lines 7-16 and Figures 16 and 17 for an example.).

Regarding claim 14, this claim is rejected under the same rationale as claim 5.

Regarding claim 15, this claim is rejected under the same rationale as claim 6.

Regarding claim 21, Tajima et al. disclose the driving apparatus of claim 5, wherein the number of the sub-fields after said adjustment equals the number of sub-fields before said adjustment for driving the panel (Column 16, 14-33 explain that the sub-fields are re-arranged, but the number of subfields stays the same.).

Regarding claim 22, Tajima et al. disclose the driving apparatus of claim 5, wherein the weighting value assigned to each of the predetermined number of sub-fields is same before and after said adjustment (Column 16, 14-33 explain that the sub-fields are re-arranged, such as SF6 in the middle and SF1 and SF2 on the ends, but the weighting value assigned to them is the same.).

Regarding claim 28, Tajima et al. disclose the driving apparatus of claim 5, wherein the adjuster includes: a sub-field arrangement selector which selects one of a plurality of pre-stored sub-field arrangements based on the gray-level distribution of said data (As stated in the rejection of claim 5, Figure 1 shows gray-scale level adjustment means 75 has sub-frame sequence pattern storage means 78.).

Regarding claim 29, Tajima et al. disclose the driving apparatus of claim 28, wherein the sub-field arrangements are predetermined to reduce contour noise for different regions having a largest portion of the gray-level distribution (Column 16, lines 21-28 explain that the sequences, i.e. arrangements are predetermined and column 42, lines 53-60 explain that this is done in order to suppress a false colored phenomenon.).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 7-8 and 16-17 rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima et al. (US 6,222,512) in view of Tanabe et al. (US 2003/0011626).

Regarding claim 7, Tajima et al. disclose the driving apparatus as claimed in claim 5.

Tajima et al. fail to teach wherein said adjuster reduces the number of sustaining pulses when gray levels of said data concentrate on a low gray level

Tanabe et al. disclose the driving apparatus as claimed in claim 5 wherein said adjuster reduces the number of sub-fields when gray levels of said data concentrate on a low gray level (Figures 8A-8H and paragraphs [0079]-[0088] show that when the gray scale number is high there is seven or eight subfields, which is an increase in the number of sustaining pulses compared to when there are less sub-fields, since each sub-field contains a sustain pulse as described in Tajima et al.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the sub-field reduction method taught by Tanabe et al. with the driving apparatus as taught by Tajima et al. such that the number of sustain pulses would be reduced/increased in order to produce less power consumption as compared to when the sustain process is performed in each sub-field.

Regarding claim 8, Tajima et al. disclose the driving apparatus as claimed in claim 5.

Tajima et al. fail to teach wherein said adjuster increases the number of sustaining pulses when gray levels of said data concentrate on high gray level

Tanabe et al. disclose a driving apparatus wherein said adjuster increases the number of sustaining pulses when gray levels of said data concentrate on high gray

level (Figures 8A-8H and paragraphs [0079]-[0088] show that when the gray scale number is high there is seven or eight subfields, which is an increase in the number of sustaining pulses compared to when there are less sub-fields, since each sub-field contains a sustain pulse as described in Tajima et al.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the sub-field reduction method taught by Tanabe et al. with the driving apparatus as taught by Tajima et al. such that the number of sustain pulses would be reduced/increased in order to produce less power consumption as compared to when the sustain process is performed in each sub-field.

Regarding claim 16, this claim is rejected under the same rationale as claim 7.

Regarding claim 17, this claim is rejected under the same rationale as claim 8.

6. Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima et al. (US 6,222,512) in view of AAPA (Figure 1 and page 1, line 1 to page 4, line 30 of the specification.).

Regarding claim 19, Tajima et al. disclose the driving apparatus of claim 5.

Tajima et al. fails to teach that the apparatus further comprises: an average picture level controller which detects an average brightness of said data and outputs

information to set a number of sustaining pulses in each of a predetermined number of sub-fields corresponding to said data.

AAPA discloses a driving apparatus for a plasma display panel comprising of an average picture level controller (Figure 1, item 17) which detects an average brightness of said data and outputs information to set a number of sustaining pulses in each of a predetermined number of sub-fields corresponding to data (Page 3, line 29 to page 4, line 7 of the specification.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made that the plasma display panel taught by Tajima et al. include and APL controller as taught by AAPA in order to allow for the adjustment of the number of sustaining pulses to provide for a more stabilized brightness of the display.

Regarding claim 20, Tajima et al. and AAPA disclose the driving apparatus of claim 19.

AAPA also disclose wherein the average picture level detector detects the average brightness of said data as received from an inverse gamma controller (Figure 1 APL controller 17 receives its input from inverse gamma controller 11B.).

7. Claim 23-27 and 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima et al. (US 6,222,512).

Regarding claim 23, Tajima et al. disclose the driving apparatus of claim 5.

Tajima et al. fail to teach wherein the adjuster generates a histogram of gray-level values corresponding to the gray-level distribution of said data, the adjuster performing said adjustment based on the histogram.

However, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to modify the adjuster taught by Tajima et al. to generate a histogram of gray-level values corresponding to the gray-level distribution of said data with the adjuster performing the adjustment based on the histogram because this would allow for the determination of how the data is distributed and how it should be changed.

Regarding claim 24, Tajima et al. disclose the driving apparatus of claim 5, wherein the detector divides the gray-level distribution into a plurality of predetermined regions (Column 16, lines 34-40 explain that a region is chosen in which the subfield arrangement is chosen.).

Tajima et al. fail to teach wherein the adjuster compares the gray-level distribution in the regions and adjusts the number of sustaining pulses in one or more of the predetermined sub-fields based on the comparison.

However, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to modify the adjuster taught by Tajima et al. to compare the gray-level distribution in the regions and adjust the number of sustaining pulses in

one or more of the predetermined sub-fields based on the comparison because this would allow for a more uniform brightness of the display over time.

Regarding claim 25, Tajima et al. disclose the driving apparatus of claim 24.

Tajima et al. fail to explicitly teach wherein the adjuster performs said comparison to determine a region having largest gray-level distribution and adjusts the number of sustaining pulses in one or more of the sub-fields to produce a corresponding change in brightness of the displayed image.

However, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to modify the adjuster taught by Tajima et al. to perform the comparison to determine a region having largest gray-level distribution and adjusts the number of sustaining pulses in one or more of the sub-fields to produce a corresponding change in brightness of the displayed image in order to provide for a more uniform display output to the user for a better viewing experience.

Regarding claim 26, Tajima et al. disclose the driving apparatus of claim 25.

Tajima et al. fail to explicitly teach wherein the adjuster decreases the number of sustaining pulses to less than a predetermined references value when the largest gray-level distribution is located in a region corresponding to a low range of gray levels.

However, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to modify the adjuster taught by Tajima et al. to decrease the number of sustaining pulses to less than a predetermined references value when

the largest gray-level distribution is located in a region corresponding to a low range of gray levels because lower gray level regions don't use as many sustaining pulses to create a desired brightness level.

Regarding claim 27, Tajima et al. disclose the driving apparatus of claim 25.

Tajima et al. fail to explicitly teach wherein the adjuster increases the number of sustaining pulses to more than the predetermined reference value when the largest gray-level distribution is located in a region corresponding to a high range of gray levels.

However, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to modify the adjuster taught by Tajima et al. to increase the number of sustaining pulses to more than the predetermined reference value when the largest gray-level distribution is located in a region corresponding to a high range of gray levels because higher gray level regions use more sustaining pulses to create a desired brightness level.

Regarding claim 30, Tajima et al. disclose the driving apparatus of claim 29.

Tajima et al. fail to explicitly teach wherein: in a first arrangement, the number of sustaining pulses in the sub-fields changes in ascending order, in a second arrangement, the number of sustaining pulses in a first portion of the sub-fields changes in ascending order, the number of sustaining pulses in a second portion of the sub-fields includes a maximum number of sustaining pulses, and the number of sustaining pulses in a third portion of the sub-fields changes in descending order; and in a third

arrangement, the number of sustaining pulses in a first portion of the sub-fields changes in ascending order and the number of sustaining pulses in a second portion of the sub-fields are set to a same number of sustaining pulses, however, Tajima et al. do suggest of placing the sub-frames in a descending order (Column 32, lines 38-50).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made that the predetermined sub-field arrangements taught by Tajima et al. would have a first arrangement, the number of sustaining pulses in the sub-fields changes in ascending order; a second arrangement, the number of sustaining pulses in a first portion of the sub-fields changes in ascending order, the number of sustaining pulses in a second portion of the sub-fields includes a maximum number of sustaining pulses, and the number of sustaining pulses in a third portion of the sub-fields changes in descending order; and in a third arrangement, the number of sustaining pulses in a first portion of the sub-fields changes in ascending order and the number of sustaining pulses in a second portion of the sub-fields are set to a same number of sustaining pulses in order to allow for the reduction of false contour by using an appropriate sub-field arrangement.

(10) Response to Arguments

I. **Claims 5, 6, 14, 15, 21, 22, 28 and 29 are Anticipated by the Tajima Patent**

The applicant begins their argument on page 11, line 3 that the Tajima patent does not disclose all of the features of claim 5. The applicant states that the Tajima patent discloses a driver that includes a gray-scale level adjustment means 75 which re-arranges the sequence of sub-frames in a frame of input data and then refers to Figure 1. The applicant continues by stating that adjustment means 75 performs its rearranging function based on two input signals: (1) a frame selection (FQ) signal and (2) an RCA1 signal. The applicant then explains that the FQ signal is generated based on a vertical synchronization signal, and that storage means 78 selects the region that indicates the sequence of subframe from FQ and the applicant refers to column 16, lines 34-40. The applicant then argues that the RCA1 signal determines the sub-frame data to be read from the input data, and that based on the FQ and RCA1 signals, the gray-level adjustment means 75 selects which of a plurality of pre-stored sub-frame sequence patterns is to be used to display input data. The examiner respectfully disagrees.

The examiner used the gray-scale level adjustment means 75 shown in Figure 3 in the rejection. Column 26, lines 11-17 explain that Figure 3 is basically the same as the device shown in Figure 1, and while description will be given of various parts will not be given, the difference between Figures 1 and 3 is in the gray-scale level adjustment means 75. Thus the examiner still cited portions of text referencing back to the description of Figure 1 in the rejection for various descriptions, however, the gray-scale adjustment means 75 shown in Figure 3 was clearly used in the rejection. Thus the cited portion of text in column 16 made by the applicant does not pertain to the gray-

scale level adjustment means 75 shown in Figure 3 which does not receive an RCA1 signal, but instead receives the input display data RGB as explained in column 26, lines 18-52. This portion of the text clearly explains that the gray-scale adjustment means 75 includes an intensity data arrangement switching means 101 and frame counter 79, which select, from a number of subframe groups, a number of subframes having predetermined numbers to make up one frame, and which, in displaying the gray-scale levels required within the frame, select subframes from the number of existing subframe groups. Column 27, lines 3-19 specifically explain that display data is applied to the intensity data arrangement switching means, and that the ROM 102 shown in Figure 3 contains the different subframe patterns, which are chosen based upon the input display data, and then column 27, lines 20-26 explain that the intensity data arrangement switching means 101 then specifies which subframes are to be turned on within the pattern in response to the desired gray-scale display level.

A. Adjustment Means 75 Does Perform the "Adjuster" Function

The applicant begins the argument that the adjustment means 75 does not perform the "adjuster" function on page 12, third paragraph. The applicant states the adjustment means 75 re-arranges the sequence of sub-frames based on FQ and RCA1, and that neither of the two signals are indicative of a detected gray-scale level distribution of input data as recited in the claim. The applicant then explains again that FQ is based on V_{SYNC} and is used by storage means 78 to a region that indicates a

sequence, and that neither of FQ or RCA1 correspond to a detected gray-scale level distribution, and accordingly, adjustment means 75 does not perform the function of an adjuster as in claim 5. The examiner respectfully disagrees.

As explained above, the examiner used the gray-scale level adjustment means 75 shown in Figure 3 in the rejection. Column 26, lines 11-17 explain that Figure 3 is basically the same as the device shown in Figure 1, and while description will be given of various parts will not be given, the difference between Figures 1 and 3 is in the gray-scale level adjustment means 75. Thus the examiner still cited portions of text referencing back to the description of Figure 1 in the rejection for various descriptions, however, the gray-scale adjustment means 75 shown in Figure 3 was clearly used in the rejection. Thus the cited portion of text in column 16 made by the applicant does not pertain to the gray-scale level adjustment means 75 shown in Figure 3 which does not receive an RCA1 signal, but instead receives the input display data RGB as explained in column 26, lines 18-52. In the rejection, for the adjustment means, the examiner referred to the adjustment means 75 as being the "adjuster" and cited text referencing back to the description of Figure 1. The examiner used this selection of text because it clearly defines that the function of the adjustment means 75 is to establish which sub-frames are to be combined and how these are to be arranged in sequence, i.e. it "adjusts". As explained already, Figures 1 and 3 are the same except that Figure 3 shows that the adjustment means 75 now receives input display data for creating the adjustment. Thus the cited portion of text proves that the adjuster in Figure 3 will adjust the sequence of subframes, however, as cited in the other portion of the rejection, the

adjuster shown in Figure 3 will receive the input display data, i.e. a gray level distribution of data, for performing this adjustment. Thus the adjustment means 75 will adjust the sequence of subframes based upon the detected gray level distribution as required by the claims. As previously explained, column 26, lines 18-52 clearly explains that the gray-scale adjustment means 75 includes an intensity data arrangement switching means 101 and frame counter 79, which select, from a number of subframe groups, a number of subframes having predetermined numbers to make up one frame, and which, in displaying the gray-scale levels required within the frame, select subframes from the number of existing subframe groups. Column 27, lines 3-19 specifically explain that display data is applied to the intensity data arrangement switching means, and that the ROM 102 shown in Figure 3 contains the different subframe patterns, which are chosen based upon the input display data, and then column 27, lines 20-26 explain that the intensity data arrangement switching means 101 then specifies which subframes are to be turned on within the pattern in response to the desired gray-scale display level.

B. Adjustment Means 75 Does Perform the "Detector" Function

The applicant begins the argument that the adjustment means 75 does not perform the "detector" function on page 13, second paragraph. The applicant argues that the adjustment means 75 does not perform the function of the detector. The applicant further states that the examiner did not point out where a gray-level detector is

shown in any of the drawing of the Tajima patents and that the examiner indicated that the function of selecting a sequence of sub-frames based on FQ and RCA1 signals necessarily requires adjustment means 75 to also perform the function of detecting a gray-level distribution. The applicant further states that the examiner's use of the phrase "necessarily requires" is tantamount to an assertion of inherent anticipation of the detecting function by Tajima and that detecting a gray-level distribution is neither disclosed or necessarily required by Tajima in order for means 75 to perform based on the FQ and RCA1 signals. The applicant continues the similar argument found above about the FQ and RCA1 signals and then state that Tajima patent does not disclose al of the features of claim 5. The examiner respectfully disagrees.

First of all, in the rejection the examiner specifically pointed to gray-scale level adjustment means 75 as being the "detector" as claimed. Thus, the applicant's argument that the examiner did not point out where a gray-level detector is shown in any of the drawings is wrong. The examiner clearly pointed to Figure 3. Furthermore, the examiner never used the phrase "necessarily requires" in the rejection at all, thus this argument is also wrong. Further, as explained above, the examiner used the gray-scale level adjustment means 75 shown in Figure 3 in the rejection. Thus the argument made by the applicant does not pertain to the gray-scale level adjustment means 75 shown in Figure 3 which does not receive an RCA1 signal, but instead receives the input display data RGB as explained in column 26, lines 18-52. As previously explained, column 26, lines 18-52 clearly explains that the gray-scale adjustment means 75 includes an intensity data arrangement switching means 101 and frame counter 79,

which select, from a number of subframe groups, a number of subframes having predetermined numbers to make up one frame, and which, in displaying the gray-scale levels required within the frame, select subframes from the number of existing subframe groups. Column 27, lines 3-19 specifically explain that display data is applied to the intensity data arrangement switching means, and that the ROM 102 shown in Figure 3 contains the different subframe patterns, which are chosen based upon the input display data, and then column 27, lines 20-26 explain that the intensity data arrangement switching means 101 then specifies which subframes are to be turned on within the pattern in response to the desired gray-scale display level. Thus, the intensity data arrangement switching means, located within the gray-scale level adjustment means 75, detects the gray level distribution of the data as required by the claims. Therefore, claims 5 is anticipated by Tajima.

The applicant argues the rejection of claim 6 on page 15, lines 3-8 of the Appeal Brief. The applicant states that Tajima does not disclose that the "adjuster adjusts both the number of sustaining pulses and a subfield arrangement in accordance with the gray level distribution of said data" and that Tajima discloses re-arranging the subfields of input data based on FQ and RCA1 and that neither signal is indicative of a gray-scale level distribution of data generated from a detector as recited in claim 5. The examiner respectfully disagrees. As explained in detail above, the examiner did not use the description of FQ and RCA1 to teach these features. The examiner stated in the rejection that if the number of subfields and the arrangement is changed, that by

changing the subfields used the number of sustaining pulses is changed, and then the examiner referenced column 27, lines 7-16 and Figures 16 and 17 for an example. Therefore, Tajima discloses the features of claim 6.

The applicant argues the rejection of claim 14 on page 15, lines 9-14 of the Appeal Brief. The applicant states that Tajima does not disclose that the features similar to claim 5 and thus does not anticipate claim 14. As explained above, the Tajima does disclose all of the features of claim 5, and thus Tajima also anticipates claim 14.

The applicant argues the rejection of claim 21 on page 15, lines 15-19 of the Appeal Brief. The applicant states that Tajima does not disclose that "the number of subfields after said adjustment equals the number of sub-fields before said adjustment for driving the panel", however, as explained in the rejection, Tajima does disclose this feature. Specifically, the examiner pointed to column 16, lines 14-33 that explain that the sub-fields are re-arranged, but the number of subfields stays the same. Thus Tajima teaches claim 21.

The applicant argues the rejection of claim 29 on page 16, lines 1-8 of the Appeal Brief. The applicant states that Tajima does not disclose that "the sub-field arrangements are predetermined to reduce contour noise for different regions having a largest portion of the gray-level distribution". The applicant states that the portion of

Tajima cited by the examiner only discloses of selecting a sequence having an alternating arrangement of high and low weights. The examiner respectfully disagrees. Column 42, lines 53-60 explicitly states: "Furthermore, according to the present invention, the number of combinations of sub-frames for realizing gray-scale levels can be increased efficiently. A difference in relative timing of a sub-frame associated with a higher luminance level, during which a cell glows, resulting from a change in gray-scale level can therefore be minimized. Consequently, a false colored contour phenomenon occurring in a motion picture can be suppressed." Therefore, Tajima does reduce contour noise and thus teaches the limitations of the claim.

II. Claims 7, 8, 16 and 17 are Obvious Over a Tajima-Tanabe Combination

The applicant begins their argument on page 16, second paragraph that the combination of Tajima and Tanabe does not disclose these features. The applicant argues that Tanabe discloses that the driving control circuit reduces or increases the number of subfields used to display data. The applicant argues that Tanabe maintains the same number of sustain pulses in Figures 8A-8H, and thus the combination does not teach the claimed invention. The examiner respectfully disagrees. The rejection was based upon a combination of references. As explained in the rejection, Tanabe discloses of changing from an eight sub-field arrangement when 255 is to be displayed, i.e. a high gray level, to only a single subfield arrangement when 1 is to be displayed, i.e. a low gray level. When used in combination with Tajima, as explained in the

rejection, this will mean that for the plasma display when the low level gray-scale is to be displayed that only a low level subfield will be used, where it is known that low level subfield use less sustaining pulses than higher leveled subfields. For a plasma display, the low gray level could not be displayed with the same number of sustaining pulses as a high gray level, which is why the combination was made using both the Tajima and Tanabe references. Therefore, the combination of references teach the claimed limitations.

The applicant argues the rejection of claim 8 on page 17, lines 5-9 of the Appeal Brief. The applicant states that Tajima does not disclose that "the adjuster increases the number of sustaining pulse when the gray levels of data concentrate on a high gray level, however, as explained by the examiner above in the argument for claim 7, the combination of the references does teach the features of the claim, i.e. Tajima and Tanabe disclose reducing or increasing the number of sustaining pulses.

The applicant argues the rejection of claim 16 on page 17, lines 10-14 of the Appeal Brief. The applicant states that Tajima does not disclose of "reducing the number of sustaining pulse when the gray levels of data concentrate on a low gray level, however, as explained by the examiner above in the argument for claim 7, the combination of the references does teach the features of the claim, i.e. Tajima and Tanabe disclose reducing or increasing the number of sustaining pulses.

III. Claims 19 and 20 are Obvious Over Tajima-AAPA Combination

Applicant argues on the bottom of page 17 that AAPA does not teach or suggest the features of base claim 5 missing from the Tajima patent and thus claims 19 and 20 are not obvious in view of a Tajima-AAPA combination, however, as explained in the argument pertaining to claim 5, Tajima does disclose all of the features of claim 5 and thus claims 19 and 20 are obvious in view of a Tajima-AAPA combination.

IV. Claims 23-27 and 30 are Obvious Over Tajima

The applicant argues the rejection of claim 23 on page 18, lines 2-7 of the Appeal Brief. The applicant states that in view of the foregoing discussion in Section I of the Appeal Brief, that Tajima does not disclose the adjuster of base claim 5 and that it logically follows that Tajima does not disclose claim 23 that further defines the adjuster. The examiner respectfully disagrees. As explained above in Section I, Tajima does disclose all of the features of claim 5, and therefore, the rejection of claim 23 is proper.

The applicant argues the rejection of claim 24 on page 18, lines 8-13 of the Appeal Brief. The applicant states that Tajima does not disclose the adjuster and detector of base claim 5 and that it logically follows that Tajima does not disclose claim 24 that further defines the functions of the adjuster and the detector. The applicant continues by stating on page 18, lines 14-19 that Tajima does not teach or suggest a

the detector divides the gray-level distribution into a plurality of predetermined regions and an adjuster compares the gray-level distribution in the regions and adjusts the number of sustaining pulses in one or more of the predetermined sub-fields based on the comparison. The examiner respectfully disagrees. As explained above in Section I, Tajima does disclose all of the features of claim 5, and therefore, the rejection of claim 24 is proper. Furthermore, in the rejection of claim 24, the examiner specifically pointed to column 16, lines 34-40 to explain that detector devices the gray-level distribution into a plurality of predetermined regions, and while the examiner stated that Tajima fails to teach that the adjuster compares the gray-level distribution in the regions and adjusts the number of sustaining pulses in one or more of the predetermined sub-fields based on the comparison, the examiner specifically stated in the rejection that one skilled in the art already having these regions would obviously compare them in the arrangement to properly adjust the subfields to allow for more uniform brightness of the display over time. Thus since the rejection of claim 5 is explained above to be proper, and the applicant has not provided any argument as to why the rejection of claim 24 is not proper aside from stating that the reference does not teach the feature, then the rejection is proper.

The applicant argues the rejection of claim 25 on page 18, line 20 to page 19, line 4 of the Appeal Brief. The applicant states that claim 25 states that the adjuster performed said comparison to determine a region having largest gray-level distribution and adjusts the number of sustaining pulses in one or more of the subfields to produce

a corresponding change in brightness of the displayed image. The applicant states that Tajima does not disclose the adjuster of base claim 5 and that it logically follows that Tajima does not disclose claim 25 that further defines the functions of the adjuster. As explained above in Section I, Tajima does disclose all of the features of claim 5, and therefore, the rejection of claim 25 is proper.

The applicant argues the rejection of claim 26 on page 19, lines 5-12 of the Appeal Brief. The applicant states that claim 26 states that the adjuster decreases the number of sustaining pulses to less than a predetermined reference value when the largest gray-level distribution is located in a region corresponding to a low range of gray levels. The applicant states that Tajima does not disclose the adjuster of base claim 5 and does not teach the additional functions of the adjuster as recited in claim 26. The examiner respectfully disagrees. As explained above in Section I, Tajima does disclose all of the features of claim 5, and therefore, the rejection of claim 26 is proper. Furthermore, in the rejection of claim 26, the examiner specifically stated that it is obvious over the teaching of Tajima to lessen the number of sustaining pulse when only low gray levels are present because lower gray level subfields do not use as many sustaining pulses to create a desired brightness. Thus since the rejection of claim 5 is explained above to be proper, and the applicant has not provided any argument as to why the rejection of claim 26 is not proper aside from stating that the reference does not teach the feature, then the rejection is proper.

The applicant argues the rejection of claim 27 on page 19, lines 13-16 of the Appeal Brief. The applicant states that claim 27 states that the adjuster increases the number of sustaining pulses to more than a predetermined reference value when the largest gray-level distribution is located in a region corresponding to a high range of gray levels, and that Tajima does not teach this feature. The examiner respectfully disagrees. In the rejection of claim 27, the examiner specifically stated that it is obvious over the teaching of Tajima to increase the number of sustaining pulse when high gray levels are present because higher gray level subfields use more sustaining pulses to create a desired brightness. Thus since the applicant has not provided any argument as to why the rejection of claim 27 is not proper aside from stating that the reference does not teach the feature, then the rejection is proper.

The applicant argues the rejection of claim 30 on page 19, line 17 to page 20, line 11 of the Appeal Brief. The applicant states that claim 30 states that in a first arrangement, the number of sustaining pulses in the sub-fields changes in ascending order, in a second arrangement, the number of sustaining pulses in a first portion of the sub-fields changes in ascending order, the number of sustaining pulses in a second portion of the sub-fields includes a maximum number of sustaining pulses, and the number of sustaining pulses in a third portion of the sub-fields changes in descending order; and in a third arrangement, the number of sustaining pulses in a first portion of the sub-fields changes in ascending order and the number of sustaining pulses in a second portion of the sub-fields are set to a same number of sustaining pulses, which is

not taught by Tajima. The examiner respectfully disagrees. In the rejection of claim 30, the examiner specifically stated that column 32, lines 38-50 suggests of placing the subframes in different orders, such as a descending order. The examiner then states that although Tajima does not explicitly the three specific arrangements, however, that it would have been obvious to one of ordinary skill to come up with these three arrangements in order to reduce false contour. Thus since the applicant has not provided any argument as to why the rejection of claim 30 is not proper aside from stating that the reference does not teach the feature, then the rejection is proper.

V. Claims 5 and 14 are Not Indefinite Under 35 USC § 112, Second Paragraph

On the bottom of page 20 of the Appeal Brief the applicant argues that claims 5 and 14 are not indefinite because one skilled in the art would understand that the subfields and subfield arrangements would contain sustain periods that contain sustain pulses. The examiner agrees that one of ordinary skill would know that the subfields contain sustaining pulses, and thus the rejection of claims 5 and 14 under 35 USC § 112, second paragraph have been withdrawn.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

(12) Conclusion

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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Conferees:

Amr Awad

AMR A. AWAD
SUPERVISORY PATENT EXAMINER

Sumati Lefkowitz

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